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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,643	08/19/2003	Kazuhide Tanaka	056203.52693US	3765

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EXAMINER	
COOKE, COLLEEN P	
ART UNIT	**PAPER NUMBER**
1754	

DATE MAILED: 04/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/642,643	TANAKA ET AL.	
	Examiner	Art Unit	
	Colleen P. Cooke	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) *6 and 7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-7* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2-17-06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Election/Restrictions

This application contains claims 6 and 7 drawn to an invention nonelected with traverse in the reply filed 7/27/05. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Newly amended claim 6 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claim 6, formerly dependent on claim 1 and now independent, is now drawn to a connection and seemingly no longer bears any relation to claim 1 or to the superconductor claimed therein. Thus Claims 1-5 are drawn to a superconducting wire rod as explained in the original restriction requirement of 7/13/2005 and Claim 6 is now drawn to a connection for connecting superconducting wire rods.
The inventions are distinct, each from the other because of the following reasons:

Inventions of claims 6 and 1-5 are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the connection for connecting superconducting wire rods can connect any MgB2 wire rods, not limited to those of claim 1 (i.e. MgB2 rods not doped with In, Sn, or Pb can be connected by the connection of claim 6); in fact the connection could be of any superconducting rods of any material and are not even limited to MgB2. The subcombination has separate utility such as a superconducting rod on its own, not connecting to another superconducting rod.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 6 (and 7 previously) withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Morita et al. (2003/0051901).

Morita et al. teaches(see Figures 1-2) a superconducting wire rod (3) filled with MgB2 powder (2); this is a superconducting wire of the powder-in-tube type wherein the MgB2 powder contained in the copper pipe (3) is considered a superconducting wire. Morita et al. teaches that the MgB2 has a particle size less than 20 μm [0051] and also desirably is doped with less than 25% indium ([0062] and [0063])Given this is the same superconductor as that which is claimed prepared in the same manner, it would be expected to inherently have the same properties of

density, critical current density, defects, bending strain rate, etc. Morita et al. also teaches (see Tables 2-3) the critical current density and the theoretical density (Table 4).

With particular respect to claims 4 and 5, Morita et al. specifically teaches that the MgB2 wire is "complexed" with NbTi wires (see Figure 2).

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Morita et al. (6921865).

The applied reference has two common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Morita et al. teaches(see Figures 1-2) a superconducting wire rod (3) filled with MgB2 powder (2); this is a superconducting wire of the powder-in-tube type wherein the MgB2 powder contained in the copper pipe (3) is considered a superconducting wire. Morita et al. teaches that the MgB2 has a particle size less than 20 μm (Column 6, lines 32-33) and also desirably is doped with less than 25% indium (Column 8, lines 10-60). Given this is the same superconductor as that which is claimed prepared in the same manner, it would be expected to inherently have the same properties of density, critical current density, defects, bending strain rate, etc. Morita et al. also teaches (see Tables 2-3) the critical current density and the theoretical density (Table 4).

With particular respect to claims 4 and 5, Morita et al. specifically teaches that the MgB2 wire is "complexed" with NbTi wires (see Figure 2).

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka et al. (2005/0174202).

The applied reference has two common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Tanaka et al. teaches a boride superconducting wire [0012] which can be MgB2 [0047] where the superconductor has a particle size less than 20 μm [0015] and wherein the superconductor desirably has additional metal powder, including indium or lead [0066], in an amount less than 25% to provide ideal properties [0067]-[0069]. Given this is the same superconductor as that which is claimed prepared in the same manner, it would be expected to inherently have the same properties of density, critical current density, defects, bending strain rate, etc. Morita et al. also teaches (see Tables 2-5) the critical current density.

With particular respect to claims 4 and 5, Tanaka et al. specifically teaches that the MgB2 wire is "complexed" with NbTi wires [0036].

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka et al. (JP 2002-373534) (citations are made to the corresponding US PGPub document for the purposes of the rejection below).

The applied reference has two common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Tanaka et al. teaches a boride superconducting wire [0012] which can be MgB2 [0047] where the superconductor has a particle size less than 20 μm [0015] and wherein the superconductor desirably has additional metal powder, including indium or lead [0066], in an amount less than 25% to provide ideal properties [0067]-[0069]. Given this is the same superconductor as that which is claimed prepared in the same manner, it would be expected to inherently have the same properties of density, critical current density, defects, bending strain rate, etc. Morita et al. also teaches (see Tables 2-5) the critical current density.

With particular respect to claims 4 and 5, Tanaka et al. specifically teaches that the MgB2 wire is "complexed" with NbTi wires [0036].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin et al. ("High critical currents in iron-clad superconducting MgB2 wires") in view of either one of Dunand (2003/0096710) or WO 02/103370.

Jin et al. teaches using the powder-in-tube (PIT) method to fabricate MgB2 wires (page 563, first full paragraph after abstract) from a commercially available MgB2 powder of –325 mesh size (see caption for Figure 1) and also teaches various metal-doped wires (see caption for Figure 3). Jin et al. teaches specifically the use 5 mol% of 1-10 μm powder of Fe (caption to Figure 4 and Figure 4) being thoroughly mixed with MgB2 powder which is then made into a wire by the PIT method. Figure 3 shows the Jc for the 5% Fe wire sample as greater than 1000 A/cm^2.

Although Jin et al. is silent as to the density of the superconducting material after a final work, it would appear that the superconductor taught by Jin et al. would inherently meet this limitation because Jin et al. teaches the same superconductor prepared in the same manner. It appears that the instantly claimed product by process is the same as that which is claimed (a doped MgB2 superconducting wire prepared by the PIT method). When the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to the applicant to establish that their product is patentably distinct and not the examiner to show the same process as making. *In re Brown*. 173 USPQ 685 and *In re Fessman*, 180 USPQ 324. Jin et

al. teaches doping MgB2 with various metals such as Fe, Mo, Y, Ag, and Ti but does not teach doping MgB2 with any one of In, Sn, or Pb.

Dunand (2003/0096710) teaches doping MgB2 with various metals such as Cu, Au, Ag, Al, Mg, Zn, **Pb**, Cd, **Sn**, Bi, Ga, Hg, and **In** (see [0043]). WO 02/103370 likewise teaches doping superconducting MgB2 with various metals such as Cu, Au, Ag, Al, Mg, Zn, **Pb**, Cd, **Sn**, Bi, Ga, Hg, and **In** (see page 8, 1st full paragraph).

It would have been obvious to modify the superconducting wire of Jin et al. by doping it with Pb, Sn, or In as taught by each of Dunand and WO 02-103370 because each references teaches that this produces an MgB2-based superconductor having good thermal and mechanical properties and also good superconducting properties which are not compromised by the addition. It would have been obvious to modify the doped MgB2 superconducting wire of Jin et al. by using Pb, Sn, or In as the dopant because either or both of Dunand and WO 02/103370 teach the use of Pb, Sn, or In as a desired dopant in MgB2 superconducting materials to achieve a useful superconductor having required physical, mechanical, and electrical properties.

With respect to claims 2 and 3, although Jin et al. is silent as to the defect portion of the wire or the bending strain rate taught therein, it would appear that the superconductor taught by Jin et al. in view of Dunand or WO 02/103370 would inherently meet this limitation because Jin et al. in view of Dunand or WO 02/103370 teaches the same superconductor prepared in the same manner.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thieme et al. (US 2003/0036482) in view of either one of Dunand (2003/0096710) or WO 02/103370.

Thieme et al. teaches preparing an MgB2 superconducting wire by the powder-in-tube method (see abstract, [0056], [0057]) which may also have a metal powder such as Fe doped in ([0079],[0080]) at a particle size of less than 0.1 μm. Thieme et al. teaches the importance of having a higher density ([0058]) and that powder core densities of greater than 95 % can be achieved ([0065]) Although Thieme et al. is silent as to the critical current density of the superconductor, it would appear that the superconductor taught by Thieme et al. would inherently meet this limitation because Thieme et al. teaches the same superconductor prepared in the same manner, even having the same density. Thieme et al. teaches doping MgB2 with various metals but does not teach doping MgB2 with any one of In, Sn, or Pb.

Dunand (2003/0096710) teaches doping MgB2 with various metals such as Cu, Au, Ag, Al, Mg, Zn, **Pb**, Cd, **Sn**, Bi, Ga, Hg, and **In** (see [0043]). WO 02/103370 likewise teaches doping superconducting MgB2 with various metals such as Cu, Au, Ag, Al, Mg, Zn, **Pb**, Cd, **Sn**, Bi, Ga, Hg, and **In** (see page 8, 1st full paragraph).

It would have been obvious to modify the superconducting wire of Thieme et al. by doping it with Pb, Sn, or In as taught by each of Dunand and WO 02-103370 because each references teaches that this produces an MgB2-based superconductor having good thermal and mechanical properties and also good superconducting properties which are not compromised by the addition. It would have been obvious to modify the doped MgB2 superconducting wire of Thieme et al. by using Pb, Sn, or In as the dopant because either or both of Dunand and WO 02/103370 teach the use of Pb, Sn, or In as a desired dopant in MgB2 superconducting materials to achieve a useful superconductor having required physical, mechanical, and electrical properties.

With respect to claims 2 and 3, although Thieme et al. is silent as to the defect portion of the wire or the bending strain rate taught therein, it would appear that the superconductor taught by Thieme et al. in view of Dunand or WO 02/103370 would inherently meet this limitation because Thieme et al. in view of Dunand or WO 02/103370 teaches the same superconductor prepared in the same manner.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin et al. ("High critical currents in iron-clad superconducting MgB2 wires") in view of either one of Dunand (2003/0096710) or WO 02/103370 as applied to claim 1 above and further in view of Holcomb (6586370).

Jin et al. in view of either one of Dunand or WO 02/103370 teach the superconducting wire as described with respect to claim 1 above but do not teach that the superconducting wire is "complexed" with a second superconductor of NbTi.

Holcomb teaches an MgB2 superconductor "complexed" with an NbTi superconductor. Holcomb specifically teaches an MgB2 superconductor (Column 24, lines 23-39) which may be "complexed" with a Type II superconductor such as NbTi for use in high magnetic field applications (Column 5, lines 25-41 and Column 7, lines 21-24). It would have been obvious to modify the superconducting wire of Jin et al. by complexing it with an NbTi superconductor to use in high magnetic field applications as taught by Holcomb.

Response to Arguments

Applicant's arguments filed 1/26/06 have been fully considered but they are not persuasive. Applicant's arguments with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

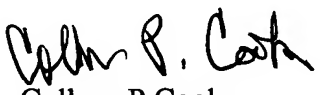
Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 2/17/06 prompted at least a portion the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen P. Cooke whose telephone number is 571-272-1170. She can normally be reached Mon.-Fri. 9:00 am - 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, her supervisor, Stan Silverman can be reached at 571-272-1358. The official fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Colleen P Cooke
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